

CLAIMS LISTING

1-26. (cancelled)

27.(new) High-performance flat sealing material wherein:

said material is thermally stable under application conditions up to 330°C.;

said material is a fiber-reinforced and/or binder reinforced composite film having a total layer thickness of from 0.01 mm to 3 mm producible by pressing at least one fiber webs wherein each fibre web of said fiber webs has a weight per unit area of from 8 to 400 g/m²;

wherein said material comprises:

- (a) a thermoplastic, selected from the group consisting of polyether ether ketone (PEEK), poly-p-phenylene sulphide (PPS), polyetherimide (PEI), polyetheramide (PEA), polyamide (PA), polysulphone (PSU), polyvinyl ether sulphone (PPSU), polyether sulphone (PES), polyaryl ether ketone (PAEK), polyether ketone (PEK), polyoxymethylene (POM) and mixtures thereof; or from the group consisting of metallic molten fibres having a melting or softening point of the metal fibres of less than 450°C., as molten fibres, in a

proportion by weight of from 30 to 97%, based on the total formulation of the fibre web, and having a average fibre length distribution of the molten fibres in the range of from 0.1 mm to 30 mm,

- (b) at least one second reinforcing fibre, selected from the group consisting of glass fibres, aramid fibres, carbon fibres, ceramic fibres, oxidised polyphenylene sulphide (PPSO₂) fibres, metal fibres, polyimide fibres, polybenzimidazole fibres, polybenzoxazole fibres and natural fibres and mixtures thereof, the thermal stability of which is greater than that of the molten fibres, in a proportion by weight from 3 to 67%, based on the total formulation of the fibre web, and an average fibre length distribution of reinforcing fibres in the range of from 0.1 mm to 30 mm, with the proviso that the average fibre length distribution of the molten fibres is smaller than that of the reinforcing fibres;
- (c) up to 60 percent by weight of a binder based on the total formulation of the fibre web, the components (a), (b) and (c) summing in each case to 100% by weight, and

(d) in addition to 100% by weight of the components (a), (b) and (c), optionally from 0.1 to 80 parts by weight of customary additives and compounding materials, selected from fibres, fibrils, fibrids, nanoscale additives in the size range from 5 to 300 nm, film-like structures, pulps, metallic or ceramic powders, or inorganic hollow microspheres having an average particle size of from 10 to 300 μm and a compressive strength of from 3.5 to 70 MPa and mixtures thereof, fibrid-like additives being preferred, under a pressure of from 0.05 to 15 N/mm^2 and a temperature of up to 450°C., which is above the melting point or softening point of the molten fibres to give a reinforced composite film having a total layer thickness of 0.01 mm to 3 mm.

- 28.(new) The high performance flat sealing material of claim 27 wherein said molten fibre is selected from the group consisting of PPS, PEI, PEK and PEEK and blends thereof and from the group consisting of the metallic molten fibres.
- 29.(new) The high performance flat sealing material of claim 27 wherein said binder is selected from fibrous, film-like, fibrid-like and is a dispersion further containing compounds which are comprising polyacrylate, polyvinyl

acetate, ethylene/vinyl acetate, polyvinyl alcohol, polyurethanes, polyaramids, (co)polyolefins, resins from the group consisting of melamine resins, phenol resins, polyurethane resins, or mixtures thereof.

- 30.(new) The high performance flat sealing material of claim 27 further comprising at least one tribologically active compounding material selected from PTFE fibre, PTFE powder, polyimide fibre, polyaramid fibre, polyaramid film, polyaramid fibrid, carbon nanofibre and carbon powder.
- 31.(new) The high performance flat sealing material of claim 27 wherein said flat sealing material, after pressing or consolidation, has a density of from 0.25 g/cm^3 to 4 g/cm^3 .
- 32.(new) The high performance flat sealing material of claim 31 wherein said flat sealing material, after pressing or consolidation, has a density of from 0.75 g/cm^3 to 1.6 g/cm^3 .
- 33.(new) The high performance flat sealing material of claim 27 wherein said molten fibres, an additive and said reinforcing fibres are present in homogeneous distribution.
- 34.(new) The high performance flat sealing material of claim 27 comprising inhomogeneity in cross-section.

- 35.(new) A cylinder head gasket comprising flat sealing material according to claim 27 applied to at least one sheet-like substrate.
- 36.(new) The cylinder head gasket of claim 35 wherein said sheet-like substrate is selected from a metallic substrate, a woven fabric, a knitted fabric and a paper.
- 37.(new) The cylinder head gasket of claim 35 wherein said flat sealing material is embedded between two substrates.
- 38.(new) The cylinder head gasket of claim 37 wherein said flat sealing material is embedded between two woven fabric substrates.
- 39.(new) The cylinder head gasket of claim 35 further comprising a laminate comprising a plurality of flat sealing materials applied to substrates.
- 40.(new) The cylinder head gasket of claim 35 having a density varying from place to place or a topographical surface or thickness varying from place to place.
- 41.(new) The cylinder head gasket of claim 40 wherein a different resilience and plasticity is achieved by topographically designed press plates or partial, sectoral pressing with compression pressures varying from place to place.

- 42.(new) The cylinder head gasket of claim 40 wherein said topographical surface varies from place to place and has been achieved by means of a top material layer which is adhesively bonded or welded to the seal.
- 43.(new) The cylinder head gasket of claim 42 wherein said top material layer is adhesively welded by laser.
- 44.(new) The cylinder head gasket of claim 41 wherein said different resilience and plasticity have been achieved by different fibre and/or filler content within the sealing surfaces.
- 45.(new) The cylinder head gasket of claim 41 wherein said different resilience and plasticity are distributed in sectors over the sealing surface and are achieved by mosaic-like assembly of the fibre mats of different resilience and plasticity.
- 46.(new) The cylinder head gasket of claim 35 wherein said flat sealing material used for the seal has different resilience and plasticity and the seal contains both composite materials, inserted elastomer parts, ceramic materials and metallic materials, such as bead rings, sheet metal rings placed on top or inserted, sheet metal rings without beading, flanged borders or reinforced films which have been welded on or applied by adhesive bonding.

- 47.(new) The cylinder head gasket of claim 35 wherein additives have been applied in a localised manner to the fibre webs in a separate operation by spraying, gravure printing or screen printing.
- 48.(new) The cylinder head gasket of claim 35 wherein said seal has a sealing geometry produced by moulding.
- 49.(new) The cylinder head gasket of claim 35 wherein said seal has a comb profile for sealing.
- 50.(new) The cylinder head gasket of claim 35 further comprising sensors or transponders which have been incorporated by means of the pressing process.
- 51.(new) The high performance flat sealing material of claim 27 with a weight per unit area of from 50 to 100 g/m².
- 52.(new) The high performance flat sealing material of claim 27 comprising from 3 to 10% by weight binder.